

EIGHT NOVELTIES IN *ABILDGAARDIA* AND *BULBOSTYLIS* (CYPERACEAE) FROM SOUTH AMERICA

ROBERT KRAL

*Botanical Research Institute of Texas
509 Pecan Street
Fort Worth, TX 76102-4060, U.S.A.*

MARK T. STRONG

*Department of Botany, MRC/166
Smithsonian Institution
Washington, D.C. 20560-0166, U.S.A.
strong.mark@nmnb.si.edu*

ABSTRACT

One new species of *Abildgaardia*, *A. papillosa*, and seven of *Bulbostylis*, are described and illustrated, and their relationships to closely allied species are discussed. In addition, an updated description of the genus along with a key to the species of New World *Abildgaardia* is provided.

RESUMEN

Se describe e ilustra una nueva especie de *Abildgaardia*, *A. papillosa*, y siete nuevas especies de *Bulbostylis*, y se discute su relación con especies cercanas. Además, se ofrece una descripción actualizada del género, acompañada de una clave para identificar las especies del Nuevo Mundo de *Abildgaardia*.

In our ongoing field-and-herbarium work with American fimbristyloid Cyperaceae, we have eight new species to report, namely one *Abildgaardia* and seven *Bulbostylis*. These novelties are all South American, seven from the planalto of Brazil, and one from Bolivia. Decisions on placement of species to genus in this work are based on distinctions between *Abildgaardia*, *Bulbostylis* and *Fimbristylis* as given in Kral (1971).

Since the description of North American *Abildgaardia* given by Kral (1.c.) has to be amended to include two other taxa, one the new species, the other a species even today referred to by authors as *Fimbristylis bahiensis* Steudel, we give below a modification that now defines the genus in the New World.

Abildgaardia Vahl, Enum. Pl. 2:296. 1805.

Perennial or annual, glabrous, caespitose. Leaves with sheaths closed save at summit, lacking cilia or fimbriae at orifice, eligulate; blades narrowly

linear to filiform, thickened, flat to variously involute or essentially lacking. Spikelets ovate to linear, either solitary and terminal on wiry culms or few to several in a loose to dense terminal cluster, rarely in a simple dichasium, in any case subtended by a single involucral bract, this shorter than inflorescence or spikelet; spikelet scales loosely imbricate, mostly keeled and subdistichous or arranged so that the spikelet appears compressed and with torque (twisted), the lower 1–2 scales sterile, those above subtending perfect flowers or apical ones male, all with dorsal/midcostal zone of 3–5 costae, these convergent at scale apex and either included or excurrent as a mucro. Florets produced on a short pedicel-joint; perianth absent. Stamens 2–3; filaments flat and twisted; anthers basifix, narrowly oblong or linear, the two thecae at maturity longitudinally and laterally dehiscing. Style 3-branched, the base trigonous, smooth or glandular-puberulent, capping the nipple-like achene apex, dehiscing at achene maturity, upwardly slender, smooth or glandular-puberulent at junction with the linear, glandular-hairy stigma branches. Achene stipitate-ovoid, the stipe stout, the body globose to broadly ovoid, strongly tricostate, apically abruptly narrowed to a pyramidal or truncate-pyramidal nipple, the three convex faces finely lined longitudinally and indistinctly by narrow cancellae, conspicuously roughened by a combination of short, coarse, transverse rugae and/or uniform or uneven coarse, large, low and dome-shaped papillae.

There are, by conservative estimate and in the strictest sense, about 15 species of *Abildgaardia* worldwide in tropical or subtropical regions; only four seem to be known for the Americas. A key to the American species is provided below, followed by detailed descriptions of the two which have bladeless leaves, one of which is new to science.

KEY TO NEW WORLD *ABILDGAARDIA*

- Plants perennial with well-developed leaf blades; culm bases swollen; spikelets ovate.
 - Spikelets pale, frequently solitary at apex of culms or 2–3 per culm, in which case scattered toward scape apex 1. *A. ovata*
 - Spikelets red-brown, mostly few in clusters at apex of culms or rarely solitary 2. *A. mexicana*
- Plants with no leaf blades or at most a cuspilike blade no longer than 5 mm; culm bases not swollen; spikelets linear.
 - Scape and leaf sheath surfaces smooth; apices of leaf sheath and spikelet scales narrowly acute to acuminate; spikelets (5–)17–15 mm long; anthers 1.5–2 mm long 3. *A. baeothryon*
 - Scape and leaf surfaces uniformly papillose; apices of leaf sheath and spikelet scales emarginate; spikelets 15–20 mm long; anthers ca. 3 mm long 4. *A. papillosa*

1. *Abildgaardia ovata* (Burm. f.) Kral, Sida 4:77. 1971. TYPE: from Java, coll. ign. (HOLOTYPE: G, n.v.). *Carex ovata* Burm.f., Fl. Indica 194. 1768. *Fimbristylis ovata* (Burm. f.) Kern, Blumea 15:126. 1967.

Cyperus monostachyus L., Mant. Pl. 180. 1771. *Abildgaardia monostachya* (L.) Vahl, Enum. Pl. 2:296. 1805. *Fimbristylis monostachya* (L.) Hassk., Pl. Jav. Rar. 61. 1848. *Iriba monostachya* (L.) Kuntze, Rev. Gen. Pl. 751. 1891.

This is the generic type from India. It is the only cosmopolitan taxon of the four treated herein. In the Americas, it ranges from peninsular Florida, U.S.A. southward through the West Indies and Mexico through Central America to southern South America (Argentina). It is a plant of basic or calcareous substrates in savannas, grasslands, landward edges of brackish or salt marsh, calcareous outcrop areas, and on dryish to seasonally dry sites, mostly at low to medium (1500 m) elevations.

2. *Abildgaardia mexicana* (Palla) Kral, Sida 4:71. 1971. TYPE: MEXICO: Bords de l'Alteseca, près de Puebla, 13 Jun 1907, F. Arsiène s.n. (HOLOTYPE: GZU, n.v.). *Fimbristylis mexicana* Palla, Oesterr. Bot. Z. 58:390-391. 1908.

Fimbristylis crassipes Boeck., Linnaea 38:392. 1874, nom. illeg., non Boeck., Flora 41:602. 1858.

So far as is presently known, this species is confined to the grasslands of the Mexican high plateau in Aguascalientes, Durango, Guanajuato, Guerrero, Distrito Federal, Jalisco, Mexico, Michoacan, Puebla, Queretaro, San Luis Potosi and Zacatecas. It is found on moist to wet, heavy dark clay earths, typically at elevations over 2000 meters.

It is noteworthy that the above two taxa have achenes over twice as long as those of the following two, but are otherwise so similar to them that drawings of them made equal in size would seem to be of the same species.

3. *Abildgaardia baeothryon* St. Hil., Voy. Distr. Diam. 2:389. 1833. (Fig.)

1. TYPE: SOUTH AMERICA. BRAZIL: "... entre les arbrisseaux de la langue de terra du lac de Saquarema, j'indiquerai les suivantes," Saint-Hilaire s.n. (HOLOTYPE: P, n.v.).

Cyperus geminatus Schrad. ex Roem. & Schult., Mant. 2:95. 1824, nom. illeg., non K.D. Koenig ex Ainslie, Mat. Med. Hindoostan 250. 1813. [*Abildgaardia geminata* (Schrad. ex Roem. & Schult.) Schrad. ex Nees in Mart., Fl. Bras. 2(1):71. 1842, nom. in syn.] [*Abildgaardia scirpoides* Nees, Linnaea 9:289. 1834, nom. nud.] *Abildgaardia scirpoides* (Nees) Lindl. & Nees in Mart., Fl. Bras. 2(1):71. 1842.

Abildgaardia aphylla Kunth, Enum. Pl. 2:248. 1837. *Iriba aphylla* (Kunth) Kuntze, Revis. Gen. Pl. 753. 1891.

[*Abildgaardia ternata* Schrad. ex Nees in Mart., Fl. Bras. 2(1):71. 1842, nom. in syn.] *Fimbristylis habiensis* Steudl., Syn. Pl. Glumac. 2:108. 1855.

[*Cyperus scirpinus* Salzm. ex Steudl., Flora 33:229. 1850, nom. nud.; Steudl., Syn. Pl. Glumac. 2:108. 1855, nom. in syn.] [*Pseudocyperus scirpinus* Steudl., Flora 33:229. 1850, nom. nud.; Steudl., Syn. Pl. Glumac. 2:108. 1855, nom. in syn.].

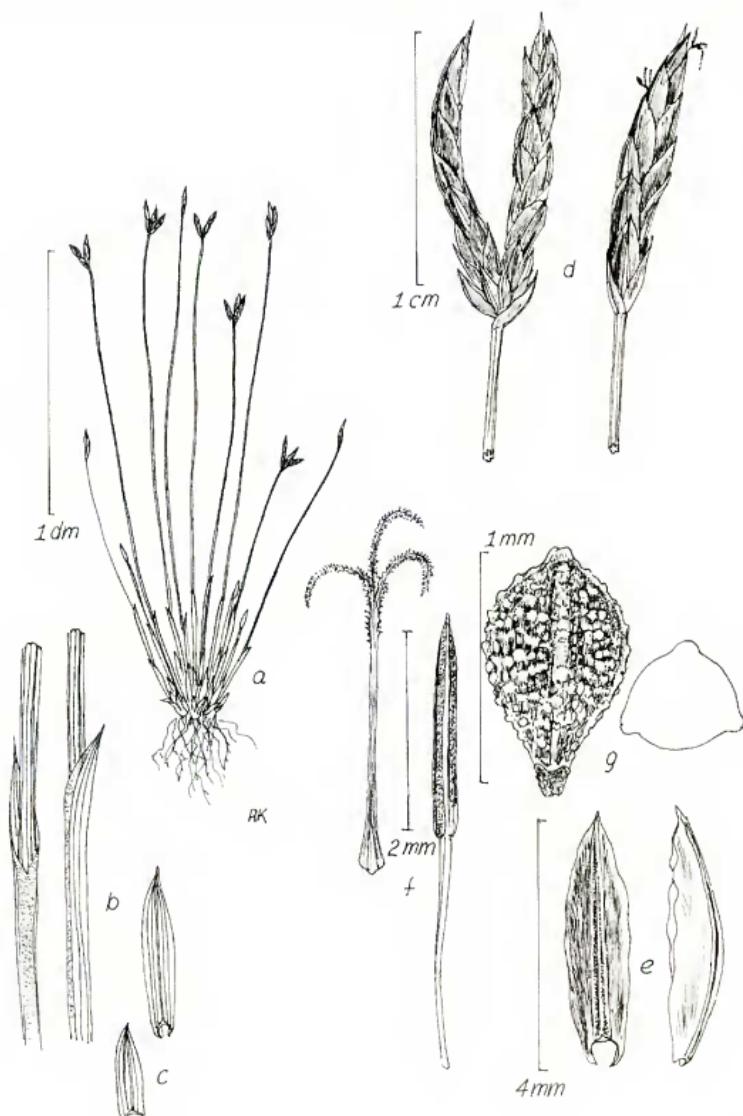


FIG. 1. *Abildgaardia baetbryon* St. Hil. (from Kral et al. 72826).—a. Habit sketch.—b. Section of culm showing ventral and dorsal view of leaf sheath.—c. Basal sheaths.—d. Inflorescence.—e. Dorsal and lateral view of spikelet scales.—f. Style (left) and stamen (right).—g. Achene.

Fimbristylis martii Boeck., Linnaea 37:24. 1871. *Iriba martii* (Boeck.) Kuntze, Revis. Gen. Pl. 753. 1891.

Annual or short-lived perennial, densely caespitose, 10–30 cm tall, glabrous. Roots slender, fibrous. Leaves few per culm, essentially sheath, distally opening with scarious entire borders convergent, the dorsal costae forming an acuminate tip or a cusplike blade no longer than 5 mm. Culms stiffly erect, slightly twisted, multicostate, smooth, the ribs interrupted by some deep sulci. Inflorescence terminal, of 1–4(–5) linear, sessile spikelets, 8–15 mm long, subtended by 2–3 short, persistent triangular bracts 3–4 mm long; spikelet scales arranged subdistichously in a long spiral; fertile scales ovate-triangular, navicular, 3–4(–5) mm long, narrowly acute to acuminate, the midzone (keel) thickened, tricostate, pale, the sides sramineous to pale brown, scarious. Stamens mostly 3, the anthers linear, 1.5–2 mm long, apiculate. Achene stipitate-ovoid, tricostate, 0.8–1 mm long, faces gray to white, lustrous, liberally dotted with separate or connected coarse papillae, these often arranged in interrupted, wavy transverse rugae, the ribs broad but low, mostly smooth.

Habitat and distribution.—*Abildgaardia baeothryon* is found on moist to dryish sands, peats and gravels of savanna and cerrado in the states of Bahia, Distrito Federal, Espírito Santo, Minas Gerais, Pernambuco, and Rio de Janeiro, Brazil, 0–1200 m.

Representative material. BRAZIL. Hab. in siccis prope Ilheos, 1820, *Riedel* s.n. (US). Bahia: *Salzmann* s.n. (US); Coastal Zone, 11 km S of Santa Cruz Cabrália, restinga by the sea, with strand vegetation progressively developing into scrub and low forest further inland, 16°22'S, 39°01'W, sea level, 17 Mar 1974, *Harley, Renvoize, Erskine, Brighton & Pinheiro* 17074 (US); Coastal Zone, on the coast between Alcobaça and Prado, 7 km NW of Alcobaça and 1 km N along road from the Rio Iranhentinga, restinga, 17°31'S, 39°13'W, sea level, 15 Jan 1977, *Harley, Mayo, Storr, Santos & Pinheiro* 17972 (US); Serra das Almas, lower NE slopes of the Pico das Almas, ca. 25 km WNW of the Vila do Rio de Contas, sandstone, metamorphic and quartzite rock outcrops with associated marsh and damp flushes, 13°33'S, 41°57'W, 1500 m, 17 Feb 1977, *Harley, Mayo, Storr, Santos & Pinheiro* 19556 (US); Serra do Sincorá, by Rio Cumbuca, ca. 3 km S of Mucugé, near site of small dam on road to Cascavel, riverside, damp sandy soil, sandstone rocks and partly burnt-over vegetation, ca. 13°01'S, 41°21'W, ca. 850 m, 4 Feb 1974, *Harley, Renvoize, Erskine, Brighton & Pinheiro* 15947 (US); Serra do Sincorá, 9 km SW of Mucugé, on road from Cascavel, waste ground by Rio Paraguaçú, with damp grassland and scattered woodland, ca. 13°02'S, 41°25'W, 950 m, 7 Feb 1974, *Harley, Renvoize, Erskine, Brighton & Pinheiro* 16101 (US); Serra do Sincorá, S of Andaraí, 16 km along road to Mucugé, near small town of Xique-Xique, sandstone rocks intersected by small streams, with some disturbed areas by roadside, 12°54'S, 41°19'W, 700–900 m, 14 Feb 1977, *Harley, Mayo, Storr, Santos & Pinheiro* 18692 (US); Mun Rio de Contas, by road to Salto of Rio Brumado, 2 km SE of Rio de Contas, sandy peat of swale in arenaceous campo, ca. 900 m, 13 Jul 1985, *Kral, Wanderley, Cerati & Lima* 72737 (SP, VDB); Mun. Palmeiras, moist sandy intervals in scrub-dotted arenaceous-rocky E-aspect campo, Serra da Larguinha, ca. 15 km S Palmeiras by the Palmeiras-Capão estrada, ca. 950 m, 19 Jul 1985, *Kral, Wanderley, Cerati & Lima* 72826 (GH, K, NY, SP, US, VDB); In moist sandy

intervals amongst arenaceous boulders and outcrops, campo by Mucujé-Andarai road, ca. 15 km N of Mucujé, just S of Rio Piaba bridge, ca. 940 m, 21 Jul 1985, *Kral, Wanderley, Cerati & Lima* 72861 (MICH, MO, NY, SP, US, VDB); Rocky summit, E facing slope just below TV transmission tower N of BR 242, ca. 5 km W of paved road to Lençóis, damp sandy sites, ca. 1200 m, 9 Nov 1988, *Kral, Wanderley & Funch* 75588 (GH, MO, NY, SP, TEX, US, VDB); Sandy-rocky campo along Rio Piaba, bridge area, by road to Mucujé from Andarai, sandy areas between rocks, 900 m, 10 Nov 1988, *Kral, Wanderley & Lima* 75616 (MO, NY, US, VDB, VSC); 5-7 km W of Alcobaça on road to Teixeira de Freitas, moist white sand clearings in coastal scrub, 0-50 m, 13 Nov 1988, *Kral, Wanderley & Lima* 75685 (GH, MO, NY, SP, TEX, US, VDB, VPI, VSC). **Distrito Federal:** Praia de Sernambetiba (Recreio dos Bandeirantes), 23°00'13"S, 43°20'49"W, ao nível do mar, 4 Apr 1952, *Smith* 6377 (US). **Espirito Santo:** Município de Vila Velha, Lagoa do Milho, beira da lagoa, substrato encharcado, 14 Jan 1975, *Peixoto* 369 (US); Mun. Linhares, Rod. BR-101, Res. Flor. da Sooretama, solo arenoso úmido, 8 Apr 1984, *Hatschbach* 47722 (US). **Minas Gerais:** Sandy areas between sandstone boulders, cerrado ca. 2 km N of Cristalina on road to Grão Mogul, 2 Nov 1988, *Kral & Wanderley* 75464 (GH, MO, NY, SP, US, VDB, VSC); Campos Rupestres, BA-Chapada Diamantina, summit near Fumaça Falls, campo rupestre, 16 May 1992, *Alves, Becker & Roppa* 4148 (US). **Pernambuco:** Prazeres, 7 Sep 1924, *Pickel* 798 (US); Prazeres, Litoralgegend, 30 Oct 1932, *Pickel* 3140 (US); In sandy soil, Recife, Oct 1933, *Pickel* 3140 (US). **Rio de Janeiro:** 18 Aug 1896, *Ule* 4155 (US); Município de Cabo Frio, Cabo Frio, Praia do Pontal, 22°56'48"S, 42°01'54"W, ao nível do mar, 17 Apr 1952, *Smith* 6563 (US).

4. *Abildgaardia papillosa* Kral & M. Strong, sp. nov. (Fig. 2). TYPE: SOUTH AMERICA. BRAZIL. Bahia: Mun. Palmeiras, sandy peaty seep areas around arenaceous boulders and outcrops, Serra do Larguinha (Sincorá?) ca. 20 km S of Palmeiras and due E of Capão by trail, ca. 1000 m, 19 Jul 1985, *Kral, Wanderley, Cerati & Lima* 72808 (HOLOTYPE: SP; ISOTYPES: GH, K, MICH, MO, NY, TEX, US 3375813, VDB, VPI, VSC).

A. baetophyton St. Hil. species Brasiliæ affinis, a qua imprimis differt habitibus altioribus; paginis foliorum et scaporum papillosis, apicibus vaginalium emarginatis; antheris longioribus (3 mm longis).

Plant annual or short-lived perennial, densely caespitose, 30-40 cm tall. Roots fibrous. Leaves entirely sheath, the outer ones more scale-like, ovate to lanciform, to 2 cm long, the principal ones 6-7 cm long, loosely tubular, papillate, multicostate save on scarious inner band, this distally becoming the scarious border of the open sheath apex, the margin entire, scabrous, converging retusely above a short mucro comprised of convergent costae. Culms slightly twisted, linear, stiff, 0.8-1 mm thick, multicostate, 1-2-sulcate, the costae fine or coarse, the surfaces dull gray-green, appearing glaucous because of dense papillosity. Inflorescence terminal, usually of 1 (rarely 2) lance-linear to elliptic-linear spikelet(s), 1.5-2 cm long, of many scales arranged subdistichously in a long spiral; sterile scales 4-5, narrowly ovate to oblong, 3.5-4 mm long, obtuse and slightly emarginate, the dorsal area thickened with 3-5 costae converging to a subapical blunt mucro; fertile scales mostly oblong to elliptic, 5-6(-7) mm long, apically narrowly rounded or emarginate, convex, the dorsal area likewise thickened, with 3

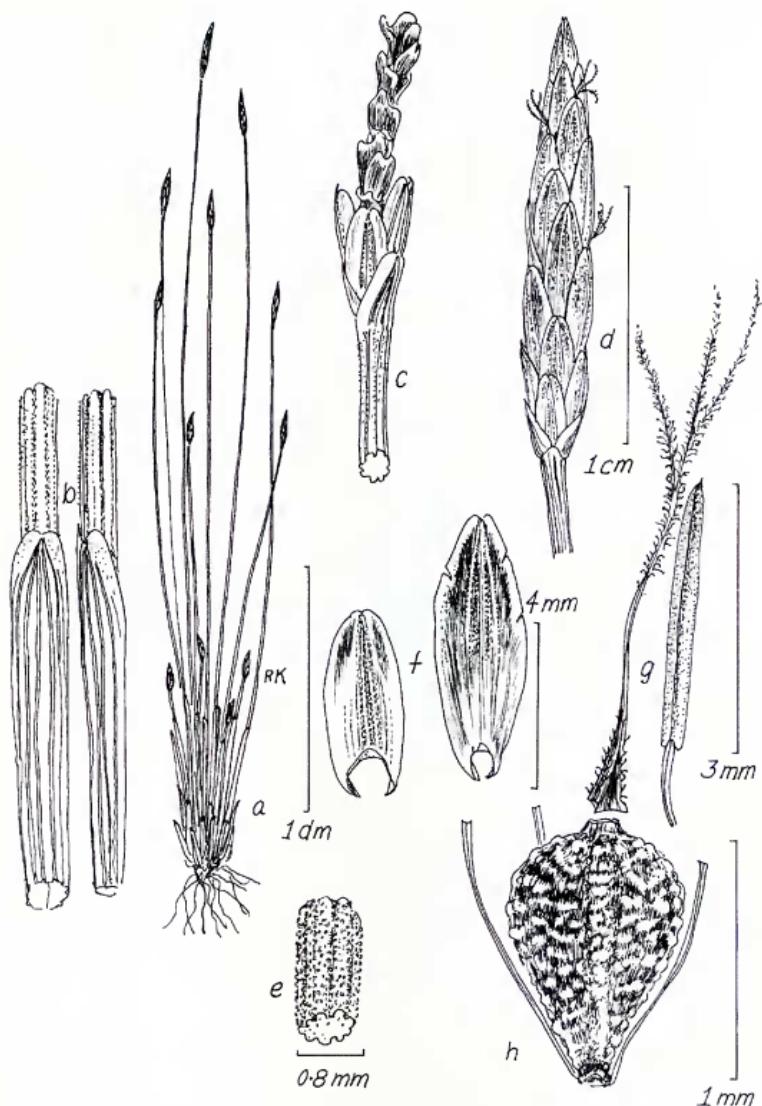


FIG. 2. *Abildgaardia papillosa* Kral & M. Strong (from the type, Kral *et al.* 72808).—a. Habit sketch.—b. Section of culm showing dorsal and lateral view of sheath.—c. Inflorescence after spikelet scales and achenes have shed.—d. Inflorescence (spikelet).—e. Detail of section of culm showing papillose surface.—f. Sterile basal spikelet scale (left) and fertile spikelet scale (right).—g. Stamen.—h. Achene and style.

coarse, usually pale costae, the scarious matrix pale brown to castaneous with a pale border. Stamens 3, the anthers narrowly linear, apiculate, ca. 3 mm long. Achene stipitate-ovoid, 1–1.2 mm long, apically obscurely trigonous but angles low, rounded, the faces convex, transversely irregularly pale-rugose with large variously interconnected papillae, ridges and papillae connected by gray, finely vertically striolate intervals.

While *Abildgaardia papillosa* is obviously closely related to *A. baetothryon*, it is at once distinguished by its taller habit, its papillose (rather than smooth) foliage and culms, its emarginate or retuse sheath apices and fertile scale tips (versus acuminate or cuspidate), its longer spikelets which are usually solitary (rather than clustered) at scape tips, and its longer spikelet scales and anthers. In the field, the papillate surfaces of leaf and scape make the plant appear glaucous.

BULBOSTYLYS Kunth, Enum. Pl. 2:205. 1837, nom. cons. (neither *Bulbostylis* Steven, 1817, nor DC, 1836, nom. rej.).

Stenophyllum Raf., Neog. 4, 1825, nom. rej.

Oncostylis Mart. ex Nees in Mart., Fl. Bras. 2(1):80. 1842.

These plants make up what must approach 100 species, mostly with wiry culms and leaves and of acidic, moist to dry, upland habitats in temperate to tropical climates worldwide. They have been considered by some as a section of *Abildgaardia*, by others as a part of *Fimbristylis*. However, in the *Bulbostylis* we have studied, there is but one example [*B. truncata* (Nees) M. Strong] in which the leaf sheath apex is not fimbriate. All save one of these tricarpellate species have a persistent tubercle that is seated above a distinct suture or atop an achenial "neck." In the latter instance there is a dramatic difference in texture and color between the achenial apex and the style base or tubercle. One becomes accustomed in the field to note a distinctive ecology for most *Bulbostylis*, nearly all of which are wiry-leaved-and-scaped physiological xerophytes, denizens of seasonally droughtly, mostly sandy and acidic sites, such as grassy uplands and fire-controlled open woodlands or savanna. Since these *Bulbostylis* are so uniform in surface characters and in ecology, we continue to treat such plants as a distinct genus. The species are given in alphabetical order.

Bulbostylis carajana Kral & M. Strong, sp. nov. (Fig. 3). **TYPE: SOUTH AMERICA.**
BRAZIL. Para: Serra dos Carajás, 2 km west of AMZA camp N-5, 6°4'S, 50°8'W, ca. 700 m, scrubby vegetation on ferric rock outcrops, moist low area on outcrops, 13 May 1982, Sperling, Condon, Mesquita, Ribeiro & Marinho 5649 (HOLOTYPE: INPA; ISOTYPES: NY, VDB).

Herba annua, dense caespitosa, subglabra, pumila, 9–15 cm alta. Radices delicatula, tenues. Folia polysticha, graciles, usque ad 5 cm longa; vaginae tubulosae, late dorsaliter viridicarinata, paucicostatae, glabrae, marginibus latis, scariosis, rufobrunneolis, ad apicem in laminas

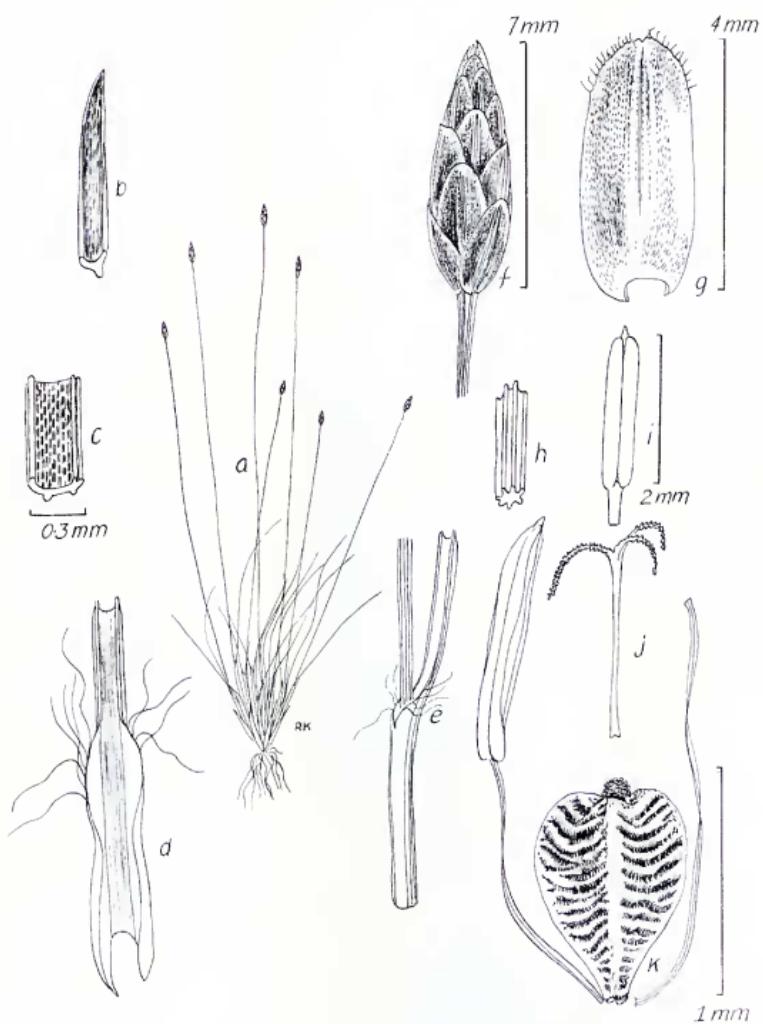


FIG. 3. *Bulbostylis carajana* Kral & M. Strong (from the type, Sperling et al. 5649).—a. Habit sketch.—b. Leaf apex.—c. Sector of leaf midblade.—d. Leaf sheath and lower blade, adaxial view.—e. Leaf sheath and lower blade, oblique view.—f. Spikelet.—g. Fertile spikelet scale.—h. Sector of scape.—i. Anther.—j. Style and stigmas.—k. Achene.

abrupte contractis, longifimbriatis; laminae capillares e basim canaliculatae, crassimarginatae, dorsaliter valde paucinervosae, apicem versus triquetrae, anguste acutae. Scapi tenues, leviter torti, 5–7-costati, 0.3–0.4 mm crassi, unispiculati. Spicae florosae, lanceolato-ovoideae, 6–9 mm longae, acutae; squamis fertilibus, tenuibus, spiraliter imbricatis, rufo-brunneolis, oblongis, 3–4 mm longis, convexis, mediane tricostatis, ad apicem ciliatis. Stamina 3; antherae anguste oblongae, ca. 2 mm longae, apiculatae. Achaenia obovoidea, ca. 1 mm longa (tuberculo inclusu), valde trilobata et tricostata, atrobrunneola, faciebus valde transverse rugosis, angulatis umberonatis. Tuberulum globosum, ca. 0.2 mm longum, atrobrunneum.

Annual, densely caespitose, subglabrous, low, 9–15 cm tall. Roots delicate, slender. Leaves polystichous, few, slender, up to 5 cm long; sheaths tubular, broadly dorsally green-carinate, few-nerved, ventrally thin, pale red-brown, abruptly narrowed into leaf blade, there long-fimbriate; blades capillary, at base canaliculate, thick-margined, dorsally strongly few-nerved, triangulate towards tip, narrowly acute. Culms filiform, slightly twisted, 5–7-costate, 0.3–0.4 mm thick, unispiculate. Spikelets many-flowered, lance-ovoid, 6–9 mm long, acute; scales thin, spirally imbricate, the sterile ones usually 2, shorter than the fertile, acute, the fertile ones oblong, 3–4 mm long, broadly rounded, scarious save for median costal area, red-brown, apically ciliate. Stamens 3, the anthers narrowly oblong, ca. 2 mm long, apiculate, tetrasporangiate. Achene obovoid, ca. 1 mm long (tubercle included), strongly trilobed and tricostate, umbilicate, dark brown, the faces strongly transversely rugose, lustrous, the angles umbo-nate; tubercle round, ca. 0.2 mm long, dark brown.

Habitat and distribution.—Thus far known only from the type collection.

Bulbostylis carajana is very similar to the widespread savanna species *B. conifera* (Kunth) C.B. Clarke, but is definitely annual, the foliage and culms smooth, the spikelets lance-ovoid (rather than cylindric), the achene more lustrous, more coarsely rugose, and umbilicate.

Bulbostylis eleocharoides Kral & M. Strong, sp. nov. (Fig. 4). TYPE: SOUTH AMERICA. BOLIVIA. Prov. Iturralde. Depto. La Paz: Luisita, 13°05'S, 67°15'W, 180 m.s.n.m., sabana humeda, al W del río Beni, 24 Feb 1988, Hasse 899 (HOLOTYPE: LPB; ISOTYPE: VDB).

Herbe perennis, 60–80 cm alta, subglabrata, culmis basi sub-bulbosis, cum foliis exterioribus squamiformibus, glabris. Folia principalia 25–40 cm longa, vaginis proxime conduplicatis, glabris, ad apicem pallide longifimbriatis; laminis lineari-filiformis, involutis, 0.7–1 mm latis, vaginis 10-plo longiore. Scapi torti et flexuosi, teretes vel subtriquetrii, ca. 1 mm crassi, glabri. Spiculae solitariae, ovoideae, 8–10 mm longae, squamis numerosis, spiraliter imbricatis; squamis steriles plures infimis spiculis longiora vel breviora; squamis fertiles ellipticae vel obovatae, 4.5–5 mm longae, late acutae, convexae. Stamina tria; antheris 2.5 mm longis. Achaenia obovoidea, ca. 3 mm longa, obscure trigona, paginis concavis, minute foveolatis.

Perennial rhizomatous herb 60–80 cm tall. Roots fibrous. Culms closely set along an imbricate-scaly rhizome. Leaves erect or ascending, 25–40 cm

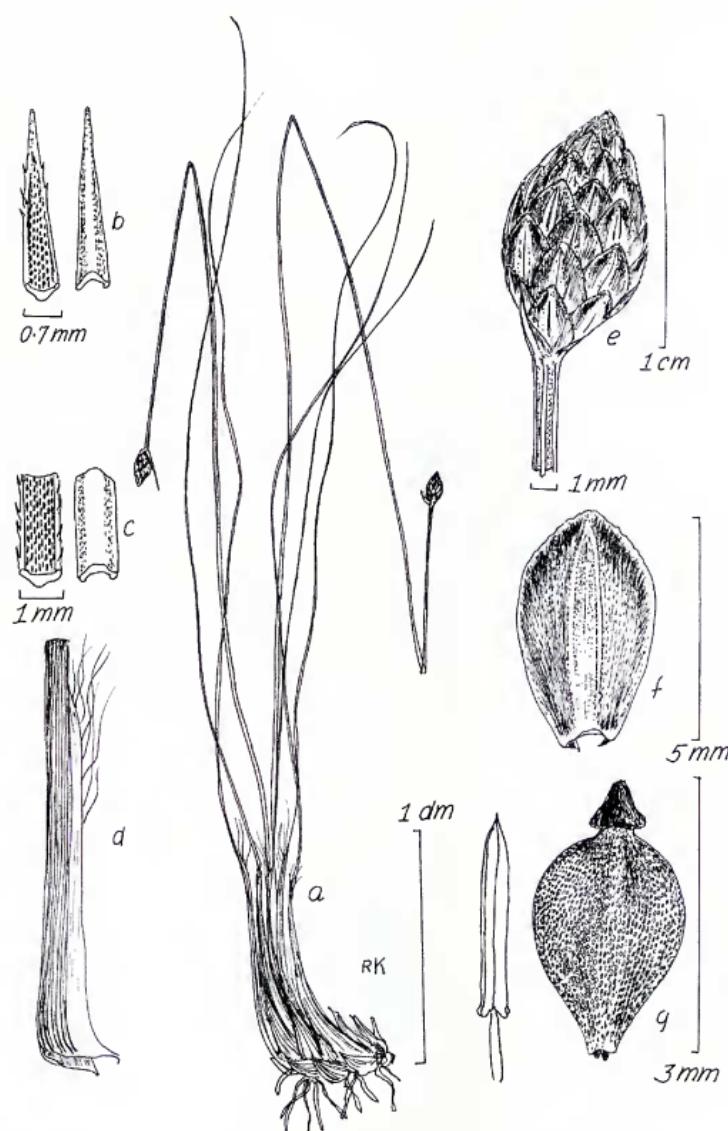


FIG. 4. *Bulbostylis clecharoides* Kral & M. Strong (from the type, *Hasse* 899).—a. Habit sketch.—b. Leaf apex, adaxial side (left), abaxial side (right).—c. Sector of leaf blade adaxial side (left), abaxial side (right).—d. Leaf base.—e. Spikelet and upper scape.—f. Fertile spikelet scale.—g. Anther (left), achene (right).

long; the outermost appressed chaffy rhizomal scales, grading up culm to more erect, scale-like basal culm leaves; principal leaves 25–40 cm long, the sheaths proximally conduplicate with the convex backs striately multinerved, glabrous, tan, with broad scarious borders pale-fimbriate at convergence with blade; blades filiform-linear, to 10 times longer than sheaths, 0.7–1 mm wide, apex subulate, shallowly concave adaxially, the involute margin thickened, pale, proximally scabrid, otherwise smooth. Culms twisted, flexuous, terete to subtriquetrous, ca. 1 mm thick or wide, glabrous. Inflorescence a single erect to ascending, ellipsoid, acute spikelet 8–10 mm long, of many tightly spirally imbricate scales with pale firm centers, brown puberulent sides and broad, dark brown erose and ciliolate borders; sterile scales several, the lowermost broadly triangular, carinate-keeled, acute or with midcostae excurrent as a green cusplike blade, this shorter or slightly longer than the spikelet, those above gradually becoming longer, grading into the fertile; fertile scales elliptic to obovate, 4.5–5 mm long, broadly acute, convex, the midcostal zone thickened, with pale border and a green median. Stamens 3, the anthers linear, 2.5 mm long, apiculate. Achene ca. 3 mm long, the body obovoid, 2.5 mm long, obscurely trigonous, pale brown with transversely wavy lines of minute pits on the concave faces, the three angles broadly rounded and but slightly raised, the achene apex narrowed distally to a distinct neck ca. 0.2 mm long, this capped by a dark, conic tubercle ca. 0.3 mm long.

PARATYPES. BOLIVIA. Depto. La Paz, Prov. Iturralde, Luisita, 13°05'S, 67°15'W, 180 m.s.n.m., sabana humeda, W del Río Beni, pastizal humedo con gramíneas bajas en macollos, 28 Feb 1984, Beck & Hasse 10111 (LPB, US). PARAGUAY. In altiplanitie et declivibus Sierra de Amambay, 1907–08, Hassler & Rojas 10040 (MO).

Habitat and distribution. Humid grasslands, savannas, Bolivia and Paraguay.

The name of this species alludes to its significant difference from other *Bulbostylis*. Its single spikelet bears a strong resemblance to those of many *Eleocharis* except for the unusual cuspidate lower sterile bract. Its achenes are again similar to *Eleocharis* in that many of the latter are species with “necked” achenes. The strongest evidence for such a plant to be *Bulbostylis* is, of course, the strongly fimbriate leaf-sheath apex and the well-developed lamina above it.

Bulbostylis latifolia Kral & M. Strong, sp. nov. (Fig. 5). TYPE: SOUTH AMERICA.

BRAZIL. Goias: sandy intervals in rocky sandy cerrado on E side BR 040, ca. 4 km N of Cristalina, ca. 900 m, 6 Dec 1988, Kral, Wanderley & Pereira 75909 (HOLOTYPE: SP; ISOTYPES: MO, US 3375811, VDB).

Planta perennis, caespitosa, 70–90 cm alta, basibus culmorum subbulbosis cum foliis exterioribus squamiformibus. Folia propria planram 1/5–1/3 aequantia; vaginis late convexis, glabris, ad apicem longifimbriatis; laminis vaginis 4–7-plo longiora, 1.5–2.2 mm latis, planis vel leviter involutis. Scapi anguste lineares, subtriangulares, ca. 1 mm crassi, glabri. Inflorescentia diffusa, anguste turbinata. Spiculae in parvis fasciculis [(1–)3–5(–6) per fasciculum],

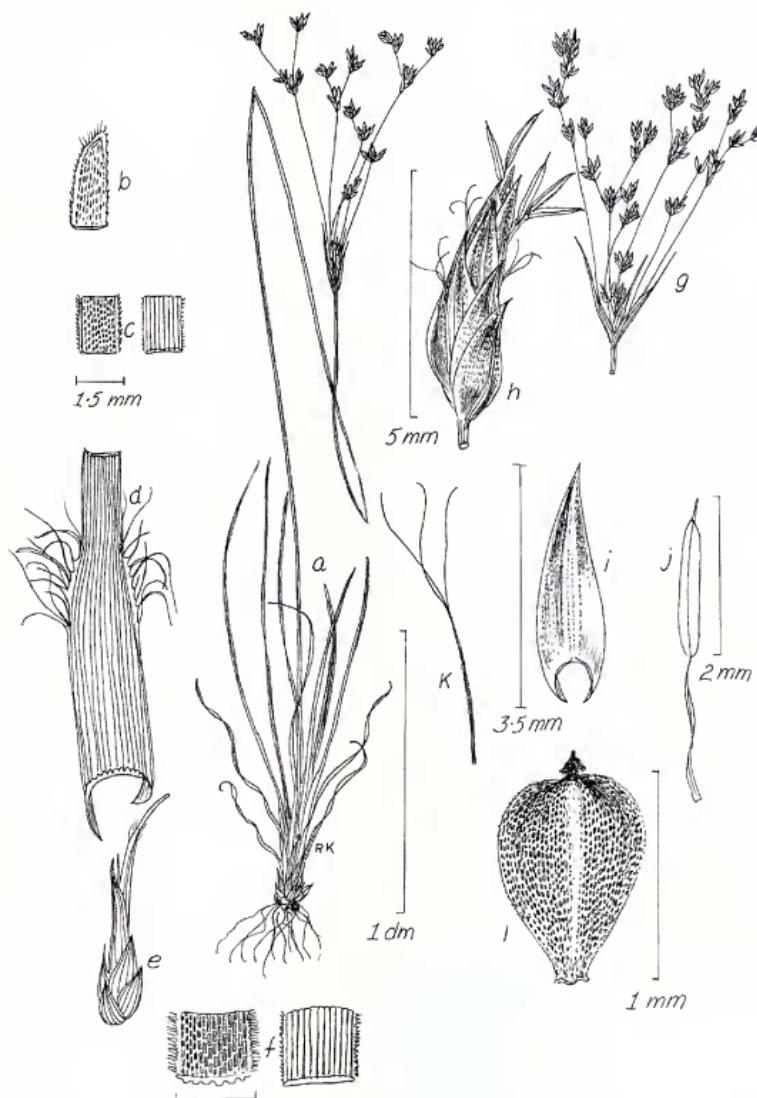


FIG. 5. *Bulbostylis latifolia* Kral & M. Strong (from the type, Kral et al. 75909).—a. Habit sketch.—b. Leaf apex.—c. Sectors of leaf midblade, adaxial (left), abaxial (right).—d. Leaf base, abaxial view.—e. Young offshoot from plant base.—f. Enlarged leaf blade sectors, adaxial (left), abaxial (right).—g. Inflorescence.—h. Spikelet.—i. Fertile spikelet scale.—j. Anther on filament apex.—k. Style and branches.—l. Achene.

anguste ovoideae vel lanceoloideae, 4–5 mm longae, acutae, brunneae vel pallide ferrugineae. Squamae fertiles anguste ovatae, 4–5 mm longae, acuminatae, naviculares. Staminæ duo vel tria; antheris 2 mm longis, longiapiçulatis. Achaenia trigono-obovoidea, trilobata, ca. 1 mm longa (tuberculo includens), subtiliter foveolata; tuberculo conico.

Perennial, caespitose, 70–90 cm tall. Roots diffuse-fibrous. Culm bases sub-bulbous, firm, with short, scaly bulbous offshoots. Leaves sub-basal, few per culm, the lowest scale-like, bladeless or with blades shorter than sheaths; principal leaves 1/5–1/3 as long as the plant, erect or ascending, 15–25 cm long; sheaths abaxially convex, strongly multi-ribbed, glabrous with broad scarious red-brown to brown borders acutely converging to blade, there long-fimbriate; blades linear, 4–7 times longer than sheaths, level or slightly concave adaxially, 1.5–2.2 mm wide, obliquely broadly acute, greenish-brown, margins slightly thickened, pale, densely ciliate or ciliolate, surfaces smooth save for scabrellous adaxial apex, abaxially multicostate. Culms narrowly linear, multi-costate, subtriangular, green, glabrous. Inflorescence a narrowly turbinate compound of variously peduncled fascicles, this much exceeding short-bladed lanceolate involucral bracts 1–3 cm long; branches several, mostly ascending around subsessile central fascicles, the longer ones 5–10 cm long, either terminating in single spikelet clusters or there rebranching in compact or open fashion; spikelets (1–)3–5(–6) per fascicle, narrowly ovoid or lanceoloid, 4–5 mm long, acute, brown to pale red-brown; fertile scales 3–6, narrowly ovate, 4–5 mm long, navicular, acuminate. Stamens (2–)3; anthers oblong, ca. 2 mm long, long-apiculate. Achenes trigonous-obvoid, ca. 1 mm long (tubercle included), apically trilobed, the faces dark-foveolate-puncticulate, gray, the angles paler, rounded; tubercle conic.

PARATYPES. BRAZIL. Goias: sandy intervals in rocky sandy cerrado on E side BR 040, ca. 4 km N of Cristalina, ca. 900 m., 6 Dec 1988, *Wanderley et al.* 1877 (SP, VDB); rocky campo, 5–6 km by road N of Alto Paraiso, sandy peat of E and NE aspect, ca. 1000 m, 30 Nov 1988, *Kral, Wanderley, Cavalcanti & Pereira* 75757 (SP, US, VDB); 4 km N of Cristalina off E side BR 050 sandy intervals in rocky cerrado, ca. 1000 m, 6 Dec 1988, *Kral, Wanderley & Pereira* 75909 (SP, US, VDB).

Habitat and distribution.—Rocky, sandy cerrado, 900–1000 m, Goias.

This species is distinctly allied to *Bulbostylis junciformis* (Kunth) C.B. Clarke but is readily distinguished by its broader, smoother, ciliate-margined leaves and fertile spikelet scales with apex not excurved and midcosta not excurrent. The grayish achene surfaces are distinctly foveolate-puncticulate, the pits short-rectangular.

***Bulbostylis lombardii* Kral & M. Strong, sp. nov. (Fig. 6).** TYPE: SOUTH AMERICA. BRAZIL. Minas Gerais: Serra do Cipo, Santana do Riacho, afloramento rochoso das Canela-de-Ema-Gigantea, proximo a portaria do IBAMA Alto Palacio, 16 Nov 1995, *J.A. Lombardi* 1029 (HOLOTYPE: BHCB; ISOTYPE: VDB).

Planta perennis, 15–30 cm alta, rhizomatosa, rhizome crasso, caudiciformis, dense pilosa,

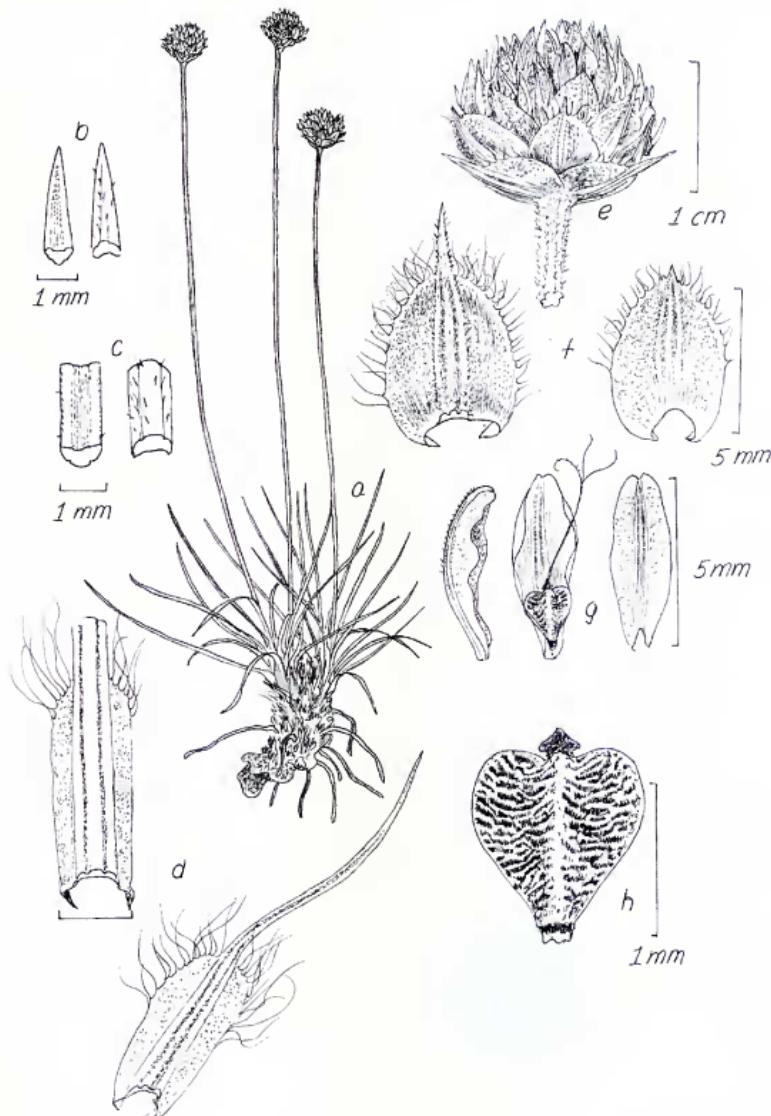


FIG. 6. *Bulbostylis lombardii* Kral & M. Strong (from the type, Lombardi 1029).—a. Habit sketch.—b. Leaf apex.—c. Section through midblade showing adaxial and abaxial surface.—d. Detail of sheath apices.—e. Inflorescence.—f. Involucral bracts.—g. Fertile spikelet scales and achene.—h. Achene.

squamoso et fibroso. Folia exteriora squamiformia, margine dense albopilosis; folia principalia vulgo expansa, 5–8 cm longa; vaginis convexis, ptominente 3–5-costatis, ad apicem longe ciliatis; laminis vaginis 4–6-plo longioribus, rigidis, 0.5–1 mm latis, dorsalter scabridis. Scapi erecti, rigidii, subteretes, ca. 1 mm crassi, dense pallide puberuli. Inflorescentia capitata, involucrata, late ovoidea vel hemispherica aut subglobosa, 1–1.5 x 1–1.5 cm; bracteae involucralis extimae ovatae, 5 mm longae, piloso-ciliatae, mucronatae, mucrone 2–3 mm longae; bracteae involucralis interiores ovatae, 5 mm longae, mucronatae. Squamae fertiles navicularae, ca. 5 mm longae, obtusae vel emarginatae. Stamina tria; antheris ca. 4 mm longis. Achaenia lata obovoidea, triloba et tricostata, 1.2–1.5 mm longa, umbilicata, valde transverse rugosa, tuberculo conico, ca. 0.3 mm longo.

Perennial densely caespitose rhizomatous herb, 15–30 cm tall. Roots thickened (for a *Bulbostylis*), fibrous. Rhizome stout, knotty, ascending, caudiciform, the newer surfaces (internodal) densely white-piliferous. Shoots numerous, densely spirally arranged around caudex, there persisting as an often burnt stubble of fibers, hairs, and old leaf sheaths, the newer (distal) caudex producing rosettes of a season. Outer rosette leaves invested in tufts of white trichomes, mostly scale-like, mostly sheath, white-pilose-ciliate, thence grading progressively longer distally on culm, the costae of the dorsal median area converging to form increasingly longer blades, the scariosus sheath borders with ciliae concentrated more at apex; principal leaves spreading, 5–8 cm long, sheaths convex with 3(–5) broad costae and broad, scariosus, brown, apically white-pilose borders; blades 4–6 times longer than sheaths, linear-filiform, 0.5–1 mm wide, adaxially shallowly involute or plane, with pale incrassate borders, abaxially convex 3(–5)-costate, sparingly scabrid, pale green. Culms stiffly erect, linear, subterete, ca. 1 mm thick, several-costate, costae densely pale-puberulent. Spikelets in dense broadly ovoid to hemispheric or subglobose involucrate heads 1–1.5 x 1–1.5 cm; involucral bracts in series, mostly broadly ovate, ca. 5 mm long, brown, ciliate, puberulent, convex, the lowermost with costal area excurrent as cusp 2–3 mm long, those above grading shorter to mucros, thence inward to fertile scales, these oblong to elliptic, navicular, ca. 5 mm long, obtuse or emarginate, the tricostate scabrellous keel not excurrent, the margin entire. Stamens 3; anthers linear, ca. 4 mm long, apiculate. Achene trigonous-ovoid, 1.2–1.5 mm long, apically strongly lobed, umbilicate, each lobe with a pale crest, the shallowly convex lobe faces dark brown to nearly nigrescent, strongly transversely rugose; tubercle nearly black, depressed-conic, 0.3 mm long.

Habitat and distribution.—This species of the planalto of Brazil is yet known only from the type.

Bulbostylis pachypoda Kral & M. Strong, sp. nov. (Fig. 7). TYPE: SOUTH AMERICA. BRAZIL. Minas Gerais: Cerro do Cabral, Armazin de Lage, ca. 15 km above and NNW of Joaquim Felicio, ca. 1100 m, sandy campo-cerrado transition, 30 Oct 1988, Kral, Wanderley & Lima 75381 (HOLOTYPE: SP; ISOTYPES: GH, MO, NY, US, VDB).

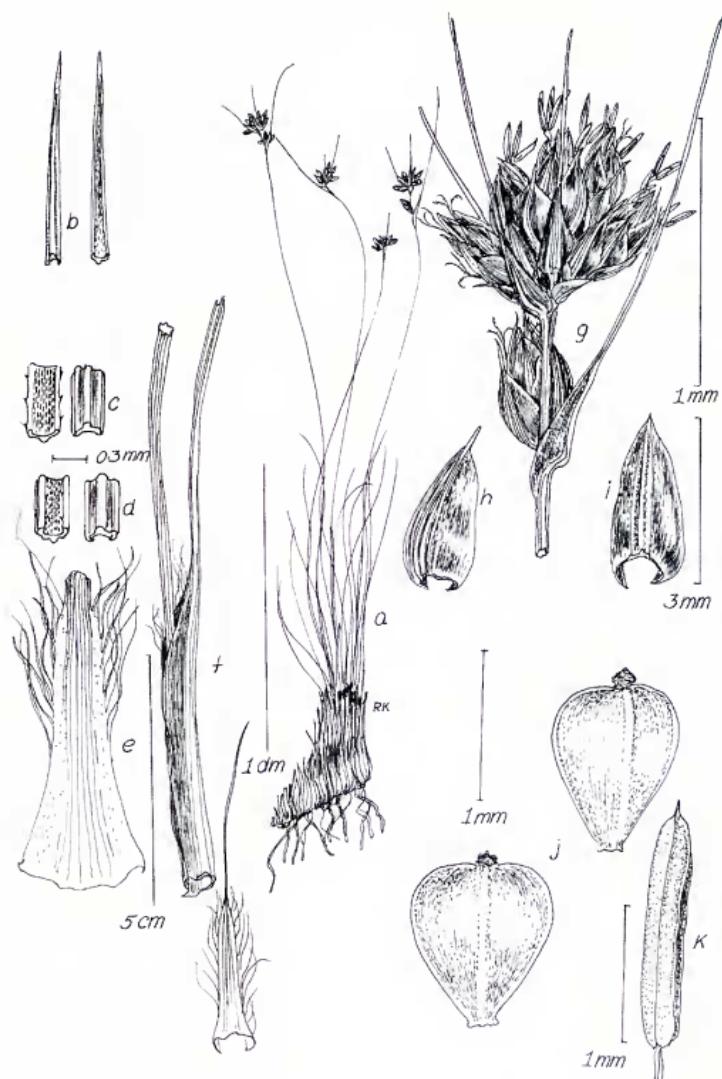


FIG. 7. *Bulbostylis pachypoda* Kral & M. Strong (from the type, *Kral et al.* 75381).—a. Habit sketch.—b. Leaf apex.—c. Sector of leaf midblade, adaxial (left), abaxial (right).—d. Sector of leaf midblade (*Kral et al.* 75175).—e. Leaf base.—f. Upper portion of leaf sheath and scape base (upper left); idealized sketch of a young outer leaf transitional to inner principal leaf (lower right).—g. Inflorescence.—h. Lower fertile spikelet scale.—i. Fertile spikelet scale.—j. Two achenes.—k. Anther.

Plantae perenne, dense caespitosa, 20–35 cm altæ, culmis basi bulbosis, arcte interconnectis, folia exteriora squamiforma, triangulata, valde nervosa, longifimbriata. Folia principalia (5–)8–15 cm longa; vaginis pallide brunneolis convexis, ad apicem parce longifimbriatis aut glabris; laminis filiformis involutis, vaginis 1–2-plo longiore, ca. 0.2–0.4 mm latis, margine remote scabriusculis. Scapi filiforme, flexuose, 0.4–0.5 mm crassi, paucicostati, glabre. Inflorescentia involucrata, pseudocapitata, terminales; fasciculi spicularum 1–2 (aut inferiore unam spiculam reducti), approximati, ovoidei, turbunati vel himispherici, usque ad 1.5 mm lati, bracteis infimis setaceis inflorescentiam leviter vel multo excedentes. Spiculae ovoideae, 4–5 mm longae, vulgo acutes, squamis spiraliter imbricatis, infimis valde carinatis, cuspidatis vel mucronatis; squamae fertiles latae ovatae, 3.5–4.5 mm longae, convexae, costis 3, pallidis, lateribus atrobrunneolis vel castaneis, nitidis, minute puberulentis. Stamina tria; antheris oblongo-linearis, ca. 2 mm longis, apiculatis. Achaenia obovoidea vel late obovoidea, ca 1–1.2 mm longa (tuberculo includens), trilobata, tricostata, superficiebus margarataceae aut cano-eburneis, subtiliter longitudine striolatis, costis prominentibus niveis.

Plants perennial, densely cespitose, 20–35 cm tall, the culm bases bulbous, closely interconnected at base, forming short thick lines radiating from clump center. Outer leaves scale-like, triangular, strongly nerved, the broad, scarious borders long-fimbriate. Principal leaves ascending to spreading, (5–)8–15 cm long, the sheaths pale brown, convex, sparsely fimbriate or smooth at the acute to acuminate apex; blades filiform, involute, 1–2 times longer than the sheaths, ca 0.2–0.4 mm wide, abaxially tricostate, the lateral costae forming smooth or remotely scabridulous margins. Culms filiform, flexuous, 0.4–0.5 mm thick, few-costate, glabrous. Inflorescence terminal, spikelets in an involucrate, head-like, ovoid to turbinate or hemispherical fascicle, or this directly subtended by an additional but smaller fascicle, sometimes reduced to a single spikelet. Involucral bracts several, setaceous-tipped, the lowest bract slightly to much exceeding the inflorescence, those at higher levels progressively shorter-bladed, those subtending individual spikelets mostly cuspidate or mucronate. Spikelets ovoid, 4–5 mm long, mostly acute, of several loosely spirally imbricate scales; fertile scales mostly ovate, 3.5–4.5 mm long, strongly convex, strongly curvate-keeled, the sides deep reddish brown to castaneous, the keel area tricostate and conspicuously paler. Stamens 3; anthers oblong-linear, ca. 2 mm long, apiculate. Achenes narrowly to broadly trigonous-ovoid, ca. 1–1.2 mm long (tubercle included), slightly trilobed, tricostata, the surfaces a lustrous gray-white or pearl, finely longitudinally striolate, the costae strong, smooth, contrastingly pure white.

PARATYPES: BRAZIL. MATO GROSSO: 5 km E of Primavera by BR 070, sandy-gravelly campo-cerrado transition, 6 Oct 1988, Kral. Wanderley & Lima 75175 (NY, SP, US, VDB).

The affinities of *Bulbostylis pachypoda* are perhaps most with the ubiquitous *B. juncoidea* (Vahl) Kük. ex Osten, particularly examples from southern Brazil, Paraguay or Argentina, in which spikelets are often dark and crowded into head-like terminal involucral fascicles. However, *B. pachypoda* has thicker, more bulbous culm bases, these connected in ascending lines

from a clump center; its leaves and culms tend to be narrower, more smooth; its achenes, which are paler, are usually a lustrous "pearly" white, and are so finely striolate as to appear smooth. The young lower (outer) leaves, usually concealed by a stubble of burned back or dried older foliage, tend to have completely fimbriate margins and appear to be transitional to the even hairier-sheathed *B. jacobinae* (Steud.) Lindm. and allies. The anthers reach 2 mm in length, which puts them in a range longer than that for *B. juncoidea* (Vahl) Kük. ex Osten and allies.

Bulbostylis scirpoidea Kral & M. Strong, sp. nov. (Fig. 8). TYPE: SOUTH AMERICA.

BRAZIL. Goias: ca. 5 km N of jct. road W to Pires do Rio by BR 050, seep meadow and associated cerrado by pond, ca. 800 m, seep by pond, 900–1000 m, 7 Dec 1988, Kral & Wanderley 75942 (HOLOTYPE: SP; ISOTYPES: US, VDB).

Planta petiennis, 60–80 cm alta, caespitosa, culmis basi bulbosis, caudiciformibus, longipilosus, cum foliis exterioribus squamiformibus. Folia principalia propria plantam 1/3–2/3 aquantia; laminis filiformis involutis, vaginis 4–6-plo longiora, tricostatis, triquetro-subulatis. Scapi lineares, subteretes, 0.6–0.7 mm crassi, glabri. Inflorescentia involucrata, receptaculo piloso, spiculis sessilis, (1–)2–3(–5), ovoideis vel lanceoloideis, rufobrunneolis, squamis fertiles anguste ovatis vel late ellipticis, curvato-carinoalis, obtusis, ad apicem ciliolatis. Stamina tria; antheris ca. 3 mm longis. Achaenia lato-obovoidea, ca. 1.2–1.4 mm longa, prominente tricostata.

Perennial, caespitose, 60–80 cm tall, the shoots arising from bulbous short stems; receptacle and lower shoot internodes with dense, pale, red-brown pilosity, 1–2 cm long. Roots fibrous. Lowest leaves scale-like, ovate to lanceolate, to 2 cm long, the inner ones cuspidate with sheath borders pilose apically; principal leaves ascending to erect, 40–60 cm long, the sheaths to 10 cm long, narrowly convex with 3–5 strong medial costae, the sides with several fainter costae and scarious red-mottled borders, gradually tapering, then abruptly joining blade, there long-villous-fimbriate; blades 4–6 times longer than sheaths, filiform, ca. 0.5 mm thick, adaxially concave with 2 pale costae marginally, abaxially strongly convex with 1 strong costa, the marginal costae with sparse, appressed, inward or retrorsely directed stiff hairs, distally tapering to triquetrous subulate tips. Culms erect, subterete, ca. 0.6–0.7 mm thick, coarsely 4–6-costate, glabrous. Inflorescence (1–)2–3(–5)-spicate, spikelets sessile above an involucre, the receptacular surface sparsely pilose, the lowest involucral bract longest, ovate to lanceolate, tricostate-keeled, slightly longer to slightly shorter than subtending spikelet(s), slightly to much exceeding the inflorescence, to 3 cm long, the base ovate, keeled, long-ciliate, the midcostae excurrent as a mucro, cusp, or linear blade; spikelets mostly ovate, 8–10 mm long, acute, with fertile scales narrowly ovate to broadly elliptic, mostly 5 mm long, curvate-keeled, obtuse or emarginate, apically ciliate. Stamens 3, the anthers linear, ca. 3 mm long, apiculate. Achene body obovoid-trigonous, 1.2–1.4 mm long, rib-angled, pale brown, angles

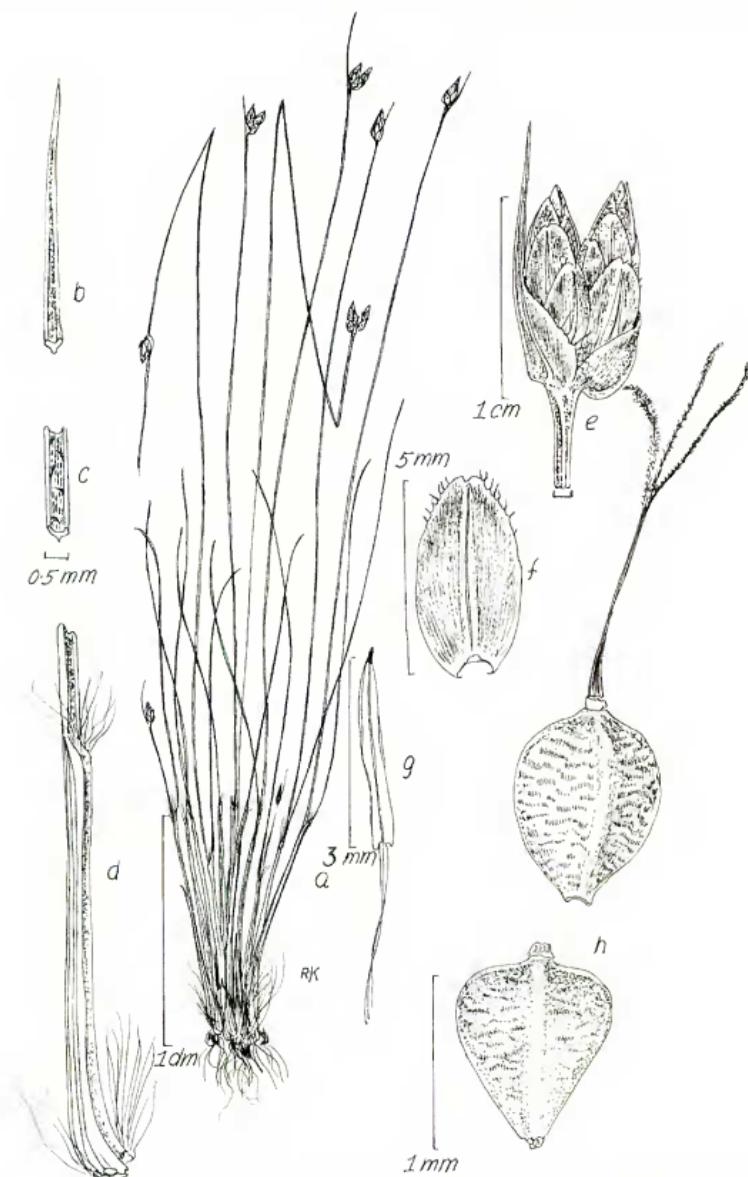


FIG. 8. *Bulbostylis scirpoidea* Kral & M. Strong (from the type, *Kral & Wanderley* 75942).—a. Habit sketch.—b. Leaf apex.—c. Sector of leaf at midblade, adaxial view.—d. Leaf sheath, oblique view.—e. Inflorescence.—f. Fertile spikelet scale.—g. Anther.—h. Two achenes.

smooth, faces shallowly convex, lustrous, shallowly transversely rugulose with very fine vertical striolae; tubercle either deciduous or short-persistent, oblong, 0.3–0.4 mm long.

PARATYPES. **BRASIL.** **DISTRITO FEDERAL:** Chapada da Contagem, 23 km NNW do Centro de Brasilia, brejo estacional, a beira da estrada, 19 Apr 1979, *Rodrigues 16* (NY, VDB). **GOIAS:** ca. 5 km N of jct. road W to Pires do Rio by BR 050, seep meadow and associated cerrado by pond, ca. 800 m, seep by pond, 900–1000 m, 7 Dec 1988, *Wanderley 1910* (SP, VDB).

Habitat and distribution.—Sandy marshy grass-sedge campo, Goias.

This is again an example of that complex of *Bulbostylis* in which the central axis of the plant is compact, pilose-vestite, a feature also displayed on the inflorescence axis (receptacle).

***Bulbostylis spectabilis* Kral & M. Strong, sp. nov. (Fig. 9).** **TYPE:** **SOUTH**

AMERICA. **BRAZIL.** Parana: Vila Vellia, abundant in occasional wet sand, SW-facing slope covered by savanna type vegetation, 5 Mar 1970, *Koyama, Koyama, Hatschbach & E. de Lima 13848* (HOLOTYPE: NY; ISOTYPE: VDB).

Planta perennis, 4–55 cm alta, caespitosa, subglabrata, crassirhizomatosa, culmis basi bulbosis, cum foliis exterioribus squamiformibus, glabris. Folia principalia 15–25 cm longa; vaginis pallide brunneolis, convexis; laminis filiformis involutis, multi-vel compluries vaginis longiore, ca. 0.3–0.5 mm latis. Scapi lineares, subteretes, ca. 1 mm crassi. Inflorescentia capitata, involucrata, ovoidea vel hemisphaerica, multispiculata, usque ad 1.5 cm lata, bracteis 1–3, valde caudati inflorescentiam excedens; spiculae lanceoloideae, 8–10 mm longae, squamis fertiles anguste ovatis, 4.5–5.5 mm longae, acuminatis. Stamina tria; antherae ca. 1 mm longis. Achaenia obovoida, 1–1.2 mm longa, tricostata, minute cancellata.

Caespitose perennial 4–55 cm tall, producing rhizomes which are interconnected bulbous bases of culms. Roots fibrous. Outer culm leaves scale-like, 4–10 mm long, strongly nerved, brown, glabrous; inner leaves progressively elongating; principal leaves erect to strongly ascending, 15–25 cm long; sheaths pale brown, scarious, multicostate, convex-backed, the scarious, pale red-brown, friable borders acutely converging to blade, there pale-fimbriate; blades several to many times longer than sheaths, filiform, 0.3–0.5 mm wide at midblade, apex filiform-setaceous, triquetrous, subulate, surface pale yellow-green, essentially glabrous save for a few scabellae toward blade base, adaxially concave to canaliculate, abaxially mostly tricostate, narrowly sulcate. Culms linear, several-costate, terete, ca. 1 mm thick, pale yellow-green. Inflorescence capitate, involucrata, broadly ovoid to hemispheric, 1–1.5 cm broad; outer involucral bracts lanciform or narrowly ovate, 5–7 mm long, slightly keeled, costae excurrent as cusp or narrowed acuminate to filiform-setaceous blades to 8(–9) cm long; fertile scales narrowly ovate or oblong, 4.5–5.5 mm long, acuminate, convex-based, apically keeled, with 3 costae. Stamens 3; anthers elliptic-linear, ca. 1 mm long, apiculate. Achenes narrowly obovoid, trigonous,

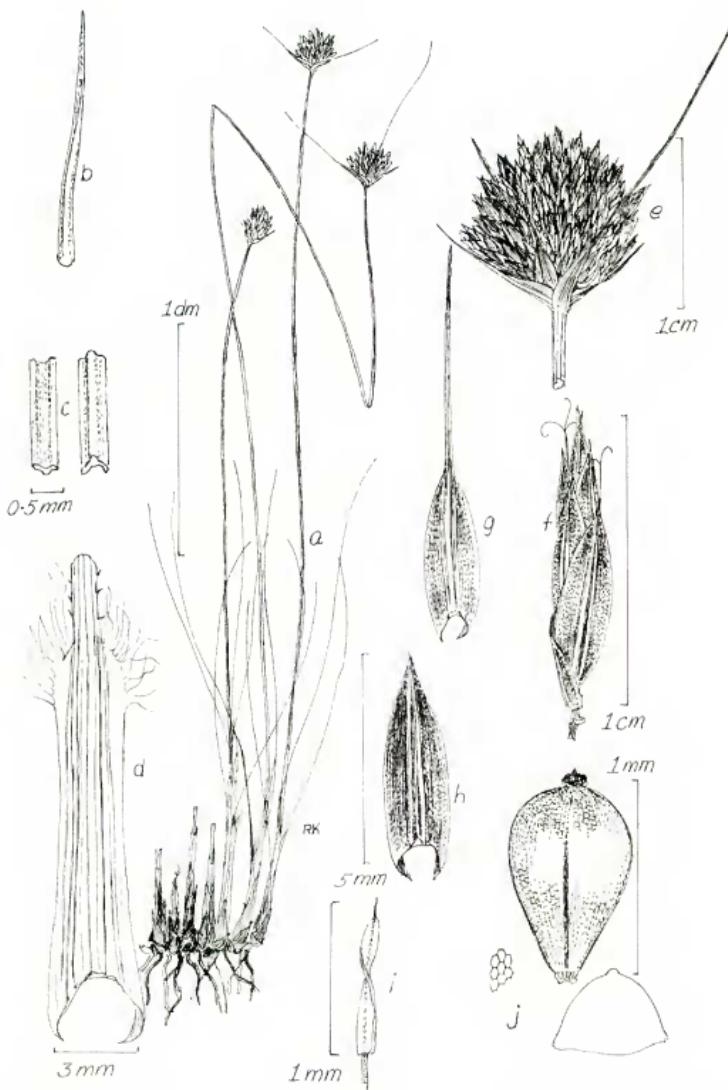


FIG. 9. *Bulbostylis spectabilis* Kral & M. Strong (from the type, Koyama *et al.* 13848).—a. Habit sketch.—b. Leaf blade apex.—c. Adaxial (left) and abaxial (right) sectors of leaf midblade.—d. Leaf sheath, abaxial side.—e. Inflorescence.—f. Spikelet.—g. Involucral bract.—h. Fertile spikelet scale.—i. Stamen.—j. Achene, abaxial faces (above), idealized enlargement of some cancellae (left), cross-section (right).

1–1.2 mm long (tubercl included), the adaxial side broadest, abaxial faces more convex, pale brown, angles dark brown, surfaces minutely cancellate.

Habitat and distribution.—Thus far known only from the type collection.

This plant, superficially resembling robust examples of *Bulbostylis sphaerocephala* (Boeck) C.B. Clarke or capitate forms of *B. junciformis* (Kunth) C.B. Clarke, differs most significantly in the peculiar rhizome of interconnected bulbous culm bases, in having perhaps the most glabrous foliage of its complex with hairs confined essentially to the pilosity of leaf sheath apex, and in the distinctive involucre, some bracts with setaceous tips to nearly 1 dm long.

ACKNOWLEDGMENTS

We would like to thank Dr. Richard Carter (VSC) and Dr. Dan Nicolson (US) for reviewing the manuscript; curators at MO and NY for loan and/or exchange material; José Cedeño-Maldonado for translating the abstract from English to Spanish; and the National Geographic Society for its travel grant to R. Kral during 1988. These aids are gratefully acknowledged.

REFERENCES

KRAL, R. 1971. A treatment of *Abildgaardia*, *Bulbostylis*, and *Fimbristylis* (Cyperaceae) for North America. *Sida* 4:57–227.